

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
15 September 2005 (15.09.2005)

PCT

(10) International Publication Number
WO 2005/086390 A1

(51) International Patent Classification⁷: **H04B 10/158**

(21) International Application Number:
PCT/EP2005/051028

(22) International Filing Date: 8 March 2005 (08.03.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
MI2004A 000442 8 March 2004 (08.03.2004) IT

(71) Applicant (for all designated States except US): **MARCONI COMMUNICATIONS SPA** [IT/IT]; Via Lodovico Calda 5, I-16153 Genova (IT).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **D'ERRICO, Antonio** [IT/IT]; Via Legnano No 120 2nd piano, San Severo (FG) (IT). **CIARAMELLA, Ernesto** [IT/IT]; Via Ludovico di Savoia, 21, I-00185 Roma (IT).

(74) Agents: **COLLIER, IAN** et al.; Marconi Intellectual Property, Crompton Close, Basildon Essex SS14 3BA (GB).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

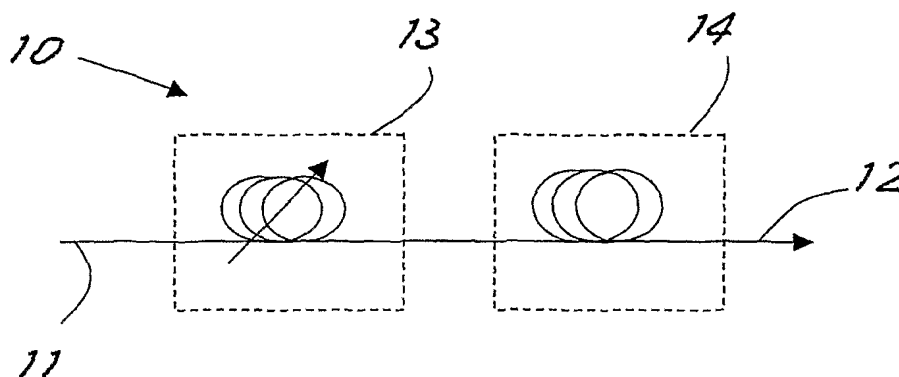
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: OPTICAL MODULATION CONVERTER AND METHOD FOR CONVERTING THE MODULATION FORMAT OF AN OPTICAL SIGNAL



(57) Abstract: An optical modulation converter (10) for converting the modulation format of an optical input signal is characterized by a birefringent medium (14), polarization maintaining fibre, with a selected differential group delay between its two main axes of symmetry through which the optical input signal is passed to be separated into two optical components each travelling along one of the main axes of the medium at a different group velocity to thereby convert the modulation format of the input signal. By appropriate selection of the differential group delay imparted by the medium relative to the bit rate of the input signal and by appropriately presenting the input signal relative to the main axes of the medium conversion between different modulation formats can be achieved. These include direct conversion from optical DPSK (Differential Phase Shift Keying) to POLSK (POLARization Shift Keying), DPSK to IM (Intensity-Modulated) through an intermediated conversion to POLSK, POLSK to IMDD (Intensity Modulation Direct Detection), and IM to POLSK.